

Application No. 09/899,649
Reply to Office Action of August 31, 2004

Amendments to and Listing of the Claims:

Please amend claims 38, 39, 41 and 42, so that the pending claims read as follows:

1-25. (Cancelled)

26. (Previously Presented) The method of running a spiral wound membrane element according to claim 29,

wherein said separation membrane comprises a permeable membrane body bonded to a surface of a porous sheet material in an anchored state.

27. (Previously Presented) The method of running a spiral wound membrane element according to claim 29, wherein the step of injecting gas includes a step of introducing a washing liquid from at least one opening end of said perforated hollow pipe and discharging said washing liquid from at least one end of said spiral wound membrane element, thereby performing back wash reverse filtration of said separation membrane with a back pressure higher than 0.05 MPa and not more than 0.3 MPa in combination with said step of injecting gas as recovery of a filtration velocity.

28. (Cancelled)

29. (Previously Presented) A method of running a spiral wound membrane element, comprising an envelope separation membrane wound on the outer peripheral surface of a perforated hollow pipe and allowing back wash reverse filtration with a back pressure higher than 0.05 MPa and not more than 0.3 MPa, comprising a step of injecting gas of not more than 0.3 MPa from at least one opening end of said perforated hollow pipe as recovery of a filtration velocity,

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wherein said step of injecting gas includes a step of axially feeding a raw liquid through said spiral wound membrane element in combination with said step of injecting gas as recovery of a filtration velocity, and

wherein said step of axially feeding a raw liquid includes a step of returning at least part of said raw liquid axially fed through said spiral wound membrane element to a feeding side of said spiral wound membrane element again.

30. (Previously Presented) A method of running a spiral wound membrane module, comprising a pressure vessel having a raw liquid inlet and one or a plurality of spiral wound membrane elements stored in said pressure vessel with said spiral wound membrane element including a perforated hollow pipe and an envelope separation membrane wound on the outer peripheral surface of said perforated hollow pipe and allowing back wash reverse filtration with a back pressure higher than 0.05 MPa and not more than 0.3 MPa, comprising

a step of injecting gas of not more than 0.3 MPa from at least one opening end of said perforated hollow pipe as recovery of a filtration velocity,

wherein said step of injecting gas includes a step of introducing a washing liquid from at least one opening end of said perforated hollow pipe and discharging said washing liquid from at least one end of said spiral wound membrane element for taking out said washing liquid from said pressure vessel thereby performing back wash reverse filtration of said separation membrane with a back pressure higher than 0.05 MPa and not more than 0.3 MPa in combination with said step of injecting gas as recovery of a filtration velocity, and

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wherein said step of introducing a washing liquid includes a step of re-feeding at last part of said washing liquid taken out from said pressure vessel to said raw liquid inlet.

31. (Previously Presented) A method of running a spiral wound membrane module, comprising a pressure vessel having a raw liquid inlet and one or a plurality of spiral wound membrane elements stored in said pressure vessel with said spiral wound membrane element including a perforated hollow pipe and an envelope separation membrane wound on the outer peripheral surface of said perforated hollow pipe and allowing back wash reverse filtration with a back pressure higher than 0.05 MPa and not more than 0.3 MPa, comprising a step of injecting gas of not more than 0.3 MPa from at least one opening end of said perforated hollow pipe as recovery of a filtration velocity,

wherein said step of injecting gas includes a step of feeding a raw liquid into said spiral wound membrane element from said raw liquid inlet of said pressure vessel and axially feeding said raw liquid through said spiral wound membrane element while taking out said axially fed raw liquid from said pressure vessel in combination with said step of injecting gas as recovery of a filtration velocity, and

wherein said step of feeding a raw liquid includes a step of re-feeding at least part of said raw liquid taken out from said pressure vessel to said raw liquid inlet.

32. (Previously Presented) The method of running a spiral wound membrane module according to claim 30,

wherein said separation membrane comprises a permeable membrane body bonded to a surface of a porous sheet material in an anchored state.

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33. (Previously Presented) The method of running a spiral wound membrane module according to claim 31, wherein said step of injecting gas includes a step of introducing a washing liquid from at least one opening end of said perforated hollow pipe and discharging said washing liquid from at least one end of said spiral wound membrane element for taking out said washing liquid from said pressure vessel thereby performing back wash reverse filtration of said separation membrane with a back pressure higher than 0.05 MPa and not more than 0.3 MPa in combination with said step of injecting gas as recovery of a filtration velocity.

34. (Previously Presented) The method of running a spiral wound membrane module according to claim 30, wherein said step of injecting gas includes a step of feeding a raw liquid into said spiral wound membrane element from said raw liquid inlet of said pressure vessel and axially feeding said raw liquid through said spiral wound membrane element while taking out said axially fed raw liquid from said pressure vessel in combination with said step of injecting gas as recovery of a filtration velocity.

35. (Cancelled)

36. (Cancelled)

37. (Cancelled)

38. (Currently Amended) A method of running a spiral wound membrane element stored in a pressure vessel having a raw liquid inlet for a raw liquid, said element comprising an envelope separation membrane wound on the outer peripheral surface of a perforated hollow pipe and allowing back wash reverse filtration with a back pressure higher than 0.05 MPa and not more than 0.3 MPa,

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comprising a step of performing an operation of injecting gas of not more than 0.3 MPa from at least one opening end of said perforated hollow pipe as recovery of a filtration velocity, wherein said step of performing an operation includes a step of performing an operation of introducing a washing liquid from at least one opening end of said perforated hollow pipe and discharging said washing liquid from at least one end of said spiral wound membrane element thereby performing back wash reverse filtration of said separation membrane with a back pressure higher than 0.05 MPa and not more than 0.3 MPa in combination with said operation of injecting gas as recovery of a filtration velocity, and

wherein said step of performing an operation includes a step of re-feeding at least part of said raw liquid taken out from said pressure vessel to said raw liquid inlet.

39. (Currently Amended) The method of running a spiral wound membrane element according to claim 38 , wherein

said step of performing an operation includes a step of performing an operation of axially feeding [[a]] said raw liquid through said spiral wound membrane element in combination with said operation of injecting gas as recovery of a filtration velocity.

40. (Previously Presented) The method of running a spiral wound membrane element according to claim 38, wherein

said separation membrane is formed by bonding a permeable membrane body to a surface of a porous sheet material, and said permeable membrane body is bonded to said surface of said porous sheet material in an anchored state.

41. (Currently Amended) A treatment system comprising:

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a spiral wound membrane module comprising a pressure vessel having a raw liquid inlet and one or a plurality of spiral wound membrane elements stored in said pressure vessel, each spiral wound membrane element including a perforated hollow pipe and an envelope separation membrane wound on the outer peripheral surface of said perforated hollow pipe and said envelope separation membrane having back pressure strength allowing back wash reverse filtration with a back pressure higher than 0.05 MPa and not more than 0.3 MPa;

a first raw liquid feeding system for feeding a raw liquid into said spiral wound membrane element through said raw liquid inlet of said pressure vessel;

a permeated liquid takeout system for taking out a permeated liquid from at least one opening end of said perforated hollow pipe;

a gas injection system for injecting gas of not more than 0.3 MPa into said spiral wound membrane element from at least one opening end of said perforated hollow pipe;

a washing liquid introduction system for introducing a washing liquid from at least one opening end of said perforated hollow pipe; and

a re-feeding system for re-feeding at least part of said raw liquid taken out from said pressure vessel to said raw liquid inlet.

42. (Currently Amended) A treatment system comprising:

a spiral wound membrane module comprising a pressure vessel having a raw liquid inlet and one or a plurality of spiral wound membrane elements stored in said pressure vessel, each spiral wound membrane element including a perforated hollow pipe and an envelope separation membrane wound on the outer peripheral surface of said perforated hollow pipe and said

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envelope separation membrane having back pressure strength allowing back wash reverse filtration with a back pressure higher than 0.05 MPa and not more than 0.3 MPa;

a first raw liquid feeding system for feeding a raw liquid into said spiral wound membrane element through said raw liquid inlet of said pressure vessel;

a permeated liquid takeout system for taking out a permeated liquid from at least one opening end of said perforated hollow pipe;

a gas injection system for injecting gas of not more than 0.3 MPa into said spiral wound membrane element from at least one opening end of said perforated hollow pipe;

a second raw liquid feeding system for feeding a raw liquid into said spiral wound membrane element through said raw liquid inlet of said pressure vessel for axially feeding said raw liquid through said spiral wound membrane element and taking out said axially fed raw liquid from said pressure vessel; and

a re-feeding system for re-feeding at least part of said raw liquid taken out from said pressure vessel to said raw liquid inlet.